

CLAIMS

1. Burner (1; 1a; 20; 25; 111; 115; 118) suppliable with a mixture of air and fuel, comprising a burner body provided with a diffuser (4; 4a, 4b; 23; 113; 117; 119) in which openings are made for the passage and subsequent combustion of said mixture, characterised in that said diffuser (4; 4a, 4b; 23; 113; 117; 119) is divided into a plurality of diffuser elements (5; 26; 26a; 26b; 26c; 26d; 37; 44; 46; 57; 60; 70; 75; 89; 93; 98; 106) that are adjacent to one another, each diffuser element (5; 26; 26a; 26b; 26c; 26d; 37; 44; 46; 57; 60; 70; 75; 89; 93; 98; 106) being at least partially free to expand in at least one direction.
2. Burner (1; 1a; 20; 25; 111; 115; 118) according to claim 1, characterised in that each diffuser element (5; 26; 26a; 26b; 26c; 26d; 37; 44; 46; 57; 60; 70; 75; 89; 93; 98; 106) has a shape that is such as to give it great mechanical rigidity.
3. Burner (1; 1a; 20; 25; 115; 118) according to claim 1 or 2, wherein said diffuser element (5; 37; 60; 75; 89; 93) has a U-shaped cross section.
4. Burner (1; 1a; 20; 25; 115; 118) according to claim 3, wherein said diffuser element (5; 37; 60; 70; 75; 89; 93) comprises a first face (7; 38; 61; 71; 76) having a substantially rectangular shape whereupon said openings (6; 41, 42; 51, 52; 81, 82; 90, 91; 94, 95) are made for the passage of said mixture of air and fuel and two side faces (8; 39, 40; 62, 63; 73, 74; 79, 80) connected to the two greater opposite sides of said first face (7; 38; 61; 71; 76) and approximately perpendicular thereto.
5. Burner (1; 1a; 20; 25; 115; 118) according to claim 4, wherein said side faces (8) are connected to said first

- face (7) in such a way as to be able to rotate elastically in relation to it.
6. Burner (1; 1a; 20; 25; 115; 118) according to claim 4, wherein said side faces (73, 74) are shaped in such a way as to be shapingly coupled with corresponding side faces (73, 74) of adjacent diffuser elements (70).
 7. Burner (1; 1a; 20; 25; 115; 118) according to any one of claims 4 to 6, wherein said diffuser element (5; 70; 75; 89; 93) furthermore comprises two front faces (14; 72; 77, 78), connected to the lesser sides of said first face (7; 38; 61; 71; 76) and approximately perpendicular thereto.
 8. Burner (1; 1a; 20; 25; 115; 118) according to claim 7, wherein said front faces (14) are connected to said first face (7) in such a way as to be able to rotate elastically in relation to it.
 9. Burner (1; 1a; 20; 25; 115; 118) according to any preceding claim, wherein each diffuser element (5; 75; 89; 93; 98) is associated with a flow-distributing element (9; 9a; 64; 85; 85a) of said mixture provided with openings (11; 68; 87) for the passage of said mixture.
 10. Burner (1; 1a; 20; 25; 115; 118) according to claim 9, wherein said distributing element (9; 9a; 64; 85; 85a) is arranged inside said diffuser element (5; 75; 89; 93; 98).
 11. Burner (1; 1a; 20; 25; 115; 118) according to claim 10, wherein said distributing element (9; 9a; 85; 85a) comprises a plate (10; 86; 86a) wherein said openings (11, 87) are made, said plate (10; 86, 86a) being arranged inside said distributing element.

12. Burner (1; 1a; 20; 25; 115; 118) according to claim 11, wherein said plate (10; 86; 86a) is provided with spacer means (13; 36; 88; 122).
13. Burner (1; 1a; 20; 25; 115; 118) according to claim 12, wherein said spacer means (13, 36; 88) is arranged at two opposite sides of said plate (10; 86).
14. Burner (1; 1a; 20; 25; 115; 118) according to claim 12, or 13, wherein said spacer means has the shape of a bump (13).
15. Burner (1; 1a; 20; 25; 115; 118) according to claim 12, or 13, wherein said spacer means has the shape of a projection (36; 88).
16. Burner (1; 1a; 20; 25; 115; 118) according to claim 12, wherein said spacer means comprises a plurality of traverse projections (122) that are substantially parallel to one another.
17. Burner (1; 1a; 20; 25; 115; 118) according to any one of claims 10 to 16, further comprising rest means (12; 120; 121) for said distributing elements (9; 9a; 85; 85a) associated with said diffuser elements (5).
18. Burner (1; 1a; 20; 25; 115; 118) according to claim 17, wherein said rest means is rod-shaped (12).
19. Burner (1; 1a; 20; 25; 115; 118) according to claim 18, wherein a pair of said rods (12) is associated with each diffuser element (5).
20. Burner (1; 1a; 20; 25; 115; 118) according to claim 18, or 19, wherein said rods (12) are arranged

substantially parallel to said side faces (8) of the diffuser element (5) and protrude at their ends from said front faces (14), through holes (15) made in the latter.

21. Burner (1; 1a; 115; 118) according to claim 20, wherein the coupling between said rods (12) and said holes (15) is a coupling with play.
22. Burner (20; 25) according to claim 18, or 19, wherein said rods (12) are arranged substantially perpendicular to said side walls (8) of the diffuser element (5) and protrude at their ends from said side walls (8), through holes (16) made in the latter.
23. Burner (20; 25) according to claim 22, wherein the coupling between said rods (12) and said holes (16) is a coupling with play.
24. Burner (1; 1a; 20; 25; 115; 118) according to claim 17, wherein said rest means comprises tabs (120) obtained in said front faces (14).
25. Burner (1; 1a; 20; 25; 115; 118) according to claim 17, wherein said rest means comprises recesses (121) made in said front faces (14).
26. Burner (1; 1a; 20; 25; 115; 118) according to claim 9, wherein said distributing element (64) has a U-shaped cross section, with a first face (65) substantially parallel to the first face (61) of the diffuser element (60) and a second face (66) and a third face (67) substantially parallel to the side faces (62; 63) of the diffuser element (60), said second face (66) and said third face (67) being connected to the free ends of said side faces.

27. Burner (1; 1a; 20; 25; 115; 118) according to claim 26, wherein in said first face (65) of said distributing element (64) openings are made (68) for the passage of said mixture of air and fuel.
28. Burner (1; 1a; 20; 25; 115; 118) according to claim 26, or 27, wherein in said first face (65) of said distributing element (64) an incision is made (69) that extends along the entire length of said first face (65), parallel to the greater sides thereof.
29. Burner (1; 1a; 20; 25; 115; 118) according to claim 1, or 2, wherein said diffuser element (26; 26a; 26b; 26c; 26d; 44; 46; 57) has a box structure.
30. Burner (1; 1a; 20; 25; 115; 118), according to claim 29, wherein said diffuser element (26; 26a; 26b; 26c; 26d; 44; 46; 57) comprises a first face (28; 47) intended to be turned towards the outside of the burner (1; 1a; 20; 25; 115; 118) whereupon said openings (6; 27; 41, 42; 51, 52) are made for the evacuation of said mixture, and a second face (29; 48) opposite said first face (28; 47), intended to be turned towards the inside of the burner (1; 1a; 20; 25; 115; 118) wherein further openings (31; 32, 33; 34; 54) are made for the passage of said mixture, said second face (29; 48) acting as a distributing element of the flow of said mixture.
31. Burner (1; 1a; 20; 25; 115; 118), according to claim 30, wherein on said second face (29; 49) an incision (30; 55) is made, that extends along the entire length of said face.
32. Burner (1; 1a; 118) according to any one of claims 29 to 31, wherein said first face (48) and said second face (49) have the shape of sector with a cylindrical surface.

33. Burner (1; 1a; 118) according to claim 32, wherein said first face (48) and said second face (49) are joined together by means of curved joint elements (49, 50).
34. Burner (1; 1a; 118) according to claim 32, wherein said first face (48) and said second face (49) are joined together by joint elements (58, 59) shaped in such a way that joint elements (58, 59) of diffuser elements (57) adjacent to one another are shapingly coupled to one another.
35. Burner (111) according to claim 1, or 2, wherein said diffuser element (106) has a substantially triangular plan shape, with a top face (107), in which openings are made (108, 108a) for the evacuation of said mixture of air and fuel, side walls (109) and front wall (110).
36. Burner (1; 1a; 20; 25; 111; 115; 118) according to any preceding claim wherein said openings (6; 27; 41, 42; 51, 52; 81, 82; 90, 91; 94, 95; 108, 108a) have the shape of slits (6; 41; 51; 81; 90; 94; 108) and/or of holes (27; 42; 52; 82; 91; 95; 108a).
37. Burner (1; 1a; 20; 25; 111; 115; 118) according to claim 36, wherein said openings (6; 27; 41, 42; 51, 52; 81, 82; 94, 95; 108, 108a) comprise rows of slits (6; 41; 51; 81; 90; 94; 108) alternating with rows of holes (27; 42; 52; 82; 91; 95; 108a).
38. Burner (1; 1a; 20; 25; 111; 115; 118) according to claim 36, wherein said openings (90, 91) comprise rows of slits staggered between themselves.
39. Burner (1; 1a; 20; 25; 111; 115; 118) according to claim 36, wherein said openings (81, 82) comprise rows of slits (81), staggered between themselves,

alternating with rows of holes (82), staggered between themselves.

40. Burner (1; 1a; 20; 25; 115; 118) according to any preceding claim wherein rigidity-varying means (43; 53; 83; 91; 96) is provided that is suitable for reducing the rigidity of the diffuser element (37; 44; 46; 57; 60; 70; 75; 89; 93) in a direction parallel to its greatest dimension.
41. Burner (1; 1a; 20; 25; 115; 118) according to claim 40, wherein said rigidity-varying means comprises further openings (43; 53; 83; 96) in the shape of slits arranged at regular intervals along said rows of slits (41; 51; 81; 94) and of holes (42; 52; 82; 95;) and extends along the entire width of said top face (38; 47; 61; 71; 76).
42. Burner (1; 1a; 20; 25; 115; 118) according to claim 40, wherein said rigidity-varying means comprises end slits (91) of said rows of slits (90) that continue for a short length on said side faces (79, 80) and end on said faces with a widening (92).
43. Burner (1; 1a; 20; 25; 115; 118) according to claim 41, wherein said further openings (83; 96) continue for a short length, at both their ends on said side walls (79, 80).
44. Burner (1; 1a; 20; 25; 115; 118) according to claim 43, wherein said further openings (83; 96) both have widenings (84; 97) at their ends.
45. Burner (1; 1a; 20; 25; 115; 118) according to claim 43, wherein said further openings (96) terminate at their respective ends with an L-shaped length (99), terminating in turn with a widening (100).

46. Burner (1; 1a; 20; 25; 115; 118) according to any preceding claim, wherein said first face (28; 47) of said diffuser element (26c; 46) is equipped, at its respective ends, with respective protrusions (35; 35a; 56).
47. Burner (1; 1a; 20; 25; 115; 118) according to claim 46, wherein said protrusions (35; 35a; 56) can be turned towards the outside, or towards the inside of the diffuser element (26c; 46).
48. Burner (1; 119) according to any one of claims 1 to 34 and 36 to 47, further comprising a base element (2) with a substantially annular shape and a head element (3) with a substantially circular shape, between which said diffuser elements (5; 26; 26a; 26b; 26c; 26d; 37; 44; 46; 57; 60; 75; 89; 93; 98) are fixed, which are arranged in a cylindrical envelope configuration.
49. Burner (1a) according to any one of claims 1 to 34 and from 36 to 47, comprising a first burner body (17) and a second burner body (18) connected together and aligned along a straight axis.
50. Burner (1a) according to claim 49, wherein said first burner body (17) comprises a base element (2) and a head element (19), between which a first diffuser (4a) is arranged and fixed consisting of a plurality of diffuser elements (5; 26; 26a; 26b; 26c; 26d; 37; 44; 46; 57; 60; 75; 89; 93; 98), arranged as a cylindrical envelope configuration.
51. Burner (1a) according to claim 49, or 50, wherein said second burner body (18) comprises a base element (19a), connected to the head element (19) of the first burner body (17), and a head element (3) between which a

second diffuser (4b) is arranged and fixed, consisting of a plurality of diffuser elements (5; 26; 26a; 26b; 26c; 26d; 37; 44; 46; 57; 60; 75; 89; 93; 98), arranged as a cylindrical envelope configuration.

52. Burner (20; 25; 113) according to any one of claims 1 to 47, wherein said diffuser elements (5; 26; 26a; 26b; 26c; 26d; 37; 44; 60; 70; 75; 89; 93; 98; 106) are arranged in a substantially flat configuration.
53. Burner (20; 25) according to claim 52, further comprising a substantially rectangular frame (21) with a peripheral flange (22), which is also substantially rectangular, inside which at least one row of diffuser elements (5; 26; 26a; 26b; 26c; 26d; 37; 44; 60; 70; 75; 89; 93; 98) placed alongside one another is arranged to form a diffuser (23).
54. Burner (25) according to claim 53, wherein inside said frame (21) a double row of diffuser elements (5; 26; 26a; 26b; 26c; 26d; 37; 44; 60; 70; 75; 89; 93; 98) placed alongside one another is arranged to form said diffuser (23).
55. Burner according to claim 52, comprising a substantially cylindrical body (112), one of the bases of which forms a diffuser (113) made with diffuser elements (106) according to claim 35.
56. Burner (115) according to any one of claims 1 to 31 and 36 to 47, comprising a body (116) having a hollow cylindrical shape, the internal surface of which forms the diffuser (117) of the burner (115).
57. Burner (1; 118) according to claim 48, wherein said base element (2) and said head element (3) are respectively equipped with internally hollow annular

protrusions (101, 102) with U-shaped sections in which the ends of said diffuser elements (46) can be inserted.

58. Burner (1; 118) according to claim 57, wherein respective front walls (103, 104) of said annular protrusions (101, 102) are provided at regular intervals with projections (105) suitable for being coupled with said projections (56) made in the ends of the diffuser elements (46).
59. Burner (20; 25) according to claim 53, or 54, wherein walls (24) of the substantially rectangular frame (21) of the burner (20; 25), parallel to the front faces (14) of the diffuser element (5) are provided with recesses (123).